



9.4.4 TREATMENT



The purpose of this portion of the Phase I Technical Review is to ensure that any proposed treatment of hazardous waste is conducted in a manner that will not pose a public health or environmental hazard. Both physical and chemical operating systems and treatment processes must be examined to determine consistency with all regulatory requirements and good engineering practice.

Permit writers are responsible for fully understanding the physical and chemical processes taking place or proposed at an applicant facility. If the permit writer needs help understanding the chemical engineering principles involved in a project, additional assistance must be sought.

KEY QUESTIONS

What treatment unit vessel details require seismic analysis and what was the specific analysis of each?

What are the most likely failure modes and what features ensure that the failure will not occur? Consider: structural failure; failure of joint, connections, fittings, and seals; uncontrolled reactions; and corrosion. What additional features of the project, especially process control features, ensure its safe operation?

What national engineering design standards were used to design the treatment vessel?

Is every treatment vessel and piping system designed and managed in a way that leakage can be detected within 24 hours after a leak starts?

Can all leakage or spillage be immediately contained and removed?

What operating features such as flame arrestor, pressure relief valves, control valve interlocking mechanisms, etc., are included in the facility design, and what inspection procedures were used to ensure they function as designed?

What steps were (or are going to be) taken to prevent damage to the treatment vessel and piping systems during installation (particularly areas which cannot be inspected visually after installation)?

Was (or will) an independent qualified professional (be) used to observe and report on the quality of the installation of all vessels and piping systems, especially underground pipes? Should the permit contain a condition requiring the submittal of an independent qualified professional report prior to the operation?

Where does the waste start, how is it moved, and where does it end up? What happens to the waste as it moves from its starting point to its ending point? How are the waste and waste reactions controlled along the route and during mixing, heating, reacting, or treatment? How is the waste monitored during movement, heating, reacting, or treatment?

What is the efficiency of the treatment process, and what is the amount and composition of any untreated waste released to the environment (discharged to air, liquids discharged to streams or land, materials going for disposal at an onsite or offsite location)?

What were the results of any leak detection testing? Was it performed in the presence of a DTSC permit writer? Did the leak detection method used meet the leak detection performance criteria for underground piping systems?

If any treatment vessel has access ports or doors, is there adequate confined space training for

maintenance and site personnel?

Where in the Part B is the above information explained, such that it is easily found and comprehended by future enforcement personnel?

Is every treatment vessel and ancillary equipment specifically included in the inspection plan, closure plan, and annual testing plan?

What specific engineering or other certifications were submitted? Was sufficient supporting documentation submitted with each to fully justify the certification statements made?

Do the engineer's supporting calculations correctly reflect the chemical and physical properties of the wastes being handled? If API or other national design standards are used verbatim, is the density, corrosion properties, viscosity, ash content, halogen content, etc., of the wastes handled differently from the densities used by the standard as design criteria?

Does the engineer's certification contain disclaimers that negate the usefulness and intent of the certification?

REQUIRED OUTPUTS

APPLICABLE REGULATIONS AND STATUTES

State Laws and Regulations:

Cal. Code of Regs., Tit. 22

66270.23 Specific Part B Information Requirements for Miscellaneous Units

66264.1 Applicability of standards to treatment facilities

Article 16 Miscellaneous Units

66264.600 Applicability

66264.601 Environmental Performance Standard

66264.602 Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action requirements apply

66264.603 Post-Closure Care may apply if soils are contaminated

Federal Laws and Regulations:

Other Laws and Regulations:

POLICIES

DTSC Policies:

EPA Policies:

Other Policies:

INSTRUCTIONS TO APPLICANTS

Handouts to be Given to Applicants:

Examples to be Given to Applicants:

CEQA CONSIDERATIONS

PUBLIC PARTICIPATION CONSIDERATIONS

Any history of past failures at the facility could raise community concerns that need to be addressed in the public participation effort.

LEGAL CONSIDERATIONS

INTERAGENCY AGREEMENTS & MOUs

COORDINATION WITH OTHERS

Other DTSC Units:

Environmental/Legislative/Industry Groups:

Other Agencies:

Special Requests:

STEP-BY-STEP PROCEDURES

Flow Charts:

Checklists:

TECHNICAL REFERENCES

Robert H. Perry and Cecil H. Chilton, Chemical Engineers' Handbook, Sixth Edition

American Public Health Association (APHA), Methods of Air Sampling and Analysis, Second Edition

Seymour Calvert and Harold M. Englund, Handbook of Air Pollution Technology, 1984, John Wiley & Sons

George T. Austin, Shreve's Chemical Process Industries, Fifth Edition, 1984, McGraw-Hill, Inc.

Storage and Treatment of Hazardous Waste in Tank Systems, Pollution Technology Review No. 146, 1987, Noyes Data Corporation

L. Bretherick, Handbook of Reactive Chemical Hazards, Third Edition, 1987, Butterworths, UK

Herbert H. Uhlig and R. Winston Revie, Corrosion and Corrosion Control, Third Edition, 1985, John Wiley & Sons, Inc.

Kirk-Othmer, Encyclopedia of Chemical Technology, all volumes

Technical Resource Document for the Storage and Treatment of Hazardous Waster in Tank Systems, December 1986, EPA/530-SW-86-044, OSWER Policy Directive No. 9483.00-1

Abstract Proceedings: Fourth Forum on Innovative Hazardous Waste Treatment Technologies: Domestic and International, December 1992, EPA/540/R-92/081

A Compendium of Technologies Used in the Treatment of Hazardous Waste, September 1987,

EPA/625/8-87/014

Technology Screening Guide for Treatment of CERCLA Soils and Sludges, September 1988, EPA/540/2-88/004

Mobile Treatment Technologies for Superfund Waste, September 1986, EPA/540/2-86/003(f)

Cost Estimates for the Siting, Permitting and Construction of New Hazardous Waste Treatment Facilities, Jacobs Engineering, EPA OSW Waste Treatment Branch, February 1986

EXAMPLES OF COMPLETED WORK PRODUCTS

TIMELINE AND PLANNING

Permit Processing Chart:

Workload Standards:

Statutory & Other Deadlines:

WP File Name: 2/CH0944_P.MAN

WP File Name for Checklist: 5/CK0944_P.MAN (not developed)

List of Examples:

List of Appendices:

List of References:

Robert H. Perry and Cecil H. Chilton, Chemical Engineers' Handbook, Sixth Edition

American Public Health Association (APHA), Methods of Air Sampling and Analysis, Second Edition

Seymour Calvert and Harold M. Englund, Handbook of Air Pollution Technology, 1984, John Wiley & Sons

George T. Austin, Shreve's Chemical Process Industries, Fifth Edition, 1984, McGraw-Hill, Inc.

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